The Effects of Movement Velocity During Squatting on Energy Expenditure and Substrate Utilization in Whole-Body Vibration

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- **Resumen:**
  - Garatachea, N., A. Jiménez, G. Bresciani, N.A. Mariño, J. González-Gallego, and J.A. de Paz. The effects of movement velocity during squatting on energy expenditure and substrate utilization in whole-body vibration. J. Strength Cond. Res. 21(2):594-598. 2007.-The purpose of this study was to examine whether and how cycle time duration affects energy expenditure and substrate utilization during whole-body vibration (WBV). Nine men performed 3 squatting exercises in execution frequency cycles of 6, 4, and 2 seconds to 90° knee flexion with vibration (Vb+) (frequency was set at 30 Hz and the amplitude of vibration was 4 mm) and without vibration (Vb?) during 3 minutes, each with an additional load of 30% of the subject’s body weight. A 2-way analysis of variance for O2 revealed a significant vibration condition main effect (p < 0.001) and a cycle time duration effect (p < 0.001). When differences were analyzed by Fisher’s LSD test, cycle time duration of 2 seconds was significantly different from 4 and 6 seconds, both in Vb+ and Vb?. Total energy expenditure (EEtot), carbohydrate oxidation rate (EEcho), and fat oxidation rate (EEfat) demonstrated a significant vibration condition main effect (EEtot: p < 0.01; EEcho: p < 0.001; EEfat: p < 0.001) and cycle time duration main effect (EEtot and EEcho: p < 0.001; EEfat: p < 0.01). EEtot, EEcho, and EEfat post hoc comparisons indicated that values for the 2-second test significantly differed from 4 and 6 seconds when compared in the same vibration condition. O2 and EE values were greater in Vb+ than in Vb? conditions with the same cycle time duration. Our study confirms that squatting at a greater frequency helps to maximize energy expenditure during exercise with or without vibration. Therefore, cycle time duration must be controlled when vibration exercise is prescribed.